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# Monte Carlo Simulations of Neutron Monitors: Fixed Stations and Portable Monitors from CMU Research

*Tuesday 7 January 2025 14:00 (15 minutes)*

This study presents Monte Carlo simulations using the FLUKA 4-4 package coupled with the DMPJET model to analyze the response of neutron monitors at the Princess Sirindhorn Neutron Monitor (PSNM) in Thailand, the South Pole Neutron Monitor, and a mobile semi-leaded neutron monitor (Changvan) during a latitude survey. The atmospheric and detector simulations accounted for deadtime corrections and employed monthly solar modulation parameters alongside galactic cosmic ray (GCR) models to calculate count rates and yield functions. Key results include the comparison of actual and simulated count rates at PSNM from September 2022 to October 2023 and time-series analysis of count rate trends at the South Pole, covering data from 1977 to the present with a detailed focus on trends from 2010 onwards. Differential and integral response functions were also determined for varying rigidity cutoffs, including the Changvan monitor. Future work aims to enhance the simulation accuracy by incorporating more frequent solar modulation parameters and increasing statistical precision.
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